CLAIMS

1. A DNA fragment having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 35, SEQ ID NO: 36 and SEQ ID NO: 37.

2. A plasmid or a partial DNA fragment thereof, characterized by comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 35, SEQ ID NO: 36 and SEQ ID NO: 37.

3. A DNA fragment having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 14, SEQ ID NO: 17 and SEQ ID NO: 22.

4. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 14, SEQ ID NO: 17 and SEQ ID NO: 22.

5. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 14, SEQ ID NO: 17 and SEQ ID NO: 22 and comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 35, SEQ ID NO: 36 and SEQ ID

NO: 37.

6. A DNA fragment having the nucleotide sequence set forth as SEQ ID NO: 76.

7. A plasmid or a partial DNA fragment thereof, characterized by comprising a promoter region having the nucleotide sequence set forth as SEQ ID NO: 76.

8. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 1, SEQ ID NO: 4, SEQ ID NO: 14, SEQ ID NO: 17 and SEQ ID NO: 22, comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 35, SEQ ID NO: 36 and SEQ ID NO: 37, and comprising a promoter region having the nucleotide sequence set forth as SEQ ID NO: 76.

9. A circular plasmid characterized by comprising a plasmid or a partial DNA fragment according to any one of claims 1 to 8, wherein the numbers of restriction endonuclease cleavage sites are *Bam*H I: 2, *Eco*R I: 2, *Kpn* I: 1, *Pvu* II: 1, *Sac* I: 1 and *Sma* I: 1, and the size is approximately 5.4 kbp.

10. A plasmid having the nucleotide sequence set forth as SEQ ID NO: 73.

11. A plasmid or a DNA fragment according to any one of claims 1 to 10, characterized by being derived from a bacterium belonging to the genus *Rhodococcus*.

12. A DNA fragment having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72.

13. A plasmid or a partial DNA fragment thereof, characterized by comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72.

14. A DNA fragment having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 45, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 61, SEQ ID NO: 62 and SEQ ID NO: 69.

15. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 45, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 61, SEQ ID NO: 62 and SEQ ID NO: 69.

16. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 45, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 61, SEQ ID NO: 62

and SEQ ID NO: 69 and comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72.

17. A plasmid or a partial DNA fragment thereof, characterized by comprising a coding region for a DNA replication-related protein having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 45, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 56, SEQ ID NO: 61, SEQ ID NO: 62 and SEQ ID NO: 69, comprising a DNA replication region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72, and comprising a promoter region having the nucleotide sequence set forth as SEQ ID NO: 76.

18. A DNA fragment having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 67 and SEQ ID NO: 47.

19. A plasmid or a partial DNA fragment thereof, characterized by comprising a mobilization protein region having at least one nucleotide sequence selected from the group consisting of the nucleotide sequences set forth as SEQ ID NO: 67 and SEQ ID NO: 47.

20. A DNA fragment having the nucleotide sequence set forth as SEQ ID NO: 75.

21. A plasmid or a partial DNA fragment thereof, characterized by comprising a mobilization-related region having the nucleotide

sequence set forth as SEQ ID NO: 75.

22. A circular plasmid characterized by comprising a plasmid or DNA fragment according to any one of claims 12 to 21, wherein the numbers of restriction endonuclease cleavage sites are *Bam*H I: 2, *Pvu* II: 4, *Sac* I: 3 and *Sma* I: 4, and the size is approximately 5.8 kbp.

23. A plasmid having the nucleotide sequence set forth as SEQ ID NO: 74.

24. A plasmid or a DNA fragment according to any one of claims 12 to 23, characterized by being derived from a bacterium belonging to the genus *Rhodococcus*.

25. A DNA fragment having the nucleotide sequence set forth as SEQ ID NO: 77.

26. A DNA fragment characterized by comprising a promoter region having the nucleotide sequence set forth as SEQ ID NO: 77.

27. A shuttle vector replicable in bacteria belonging to the genus *Rhodococcus* and *E. coli*, and comprising a plasmid or partial DNA fragment thereof according to any one of claims 1 to 26 and a DNA region replicable in *E. coli*.

28. A vector characterized by being constructed using a shuttle vector according to claim 27.

29. A vector characterized by comprising a plasmid or DNA fragment according to any one of claims 6, 7, 25 or 26.

30. A vector according to claim 28 or 29, characterized by having inserted therein an aminoketone asymmetric reductase gene.

31. A vector according to claim 30, characterized in that the aminoketone asymmetric reductase gene is a nucleic acid coding for a

protein consisting the amino acid sequence set forth as SEQ ID NO: 78, or a nucleic acid that codes for a protein having the amino acid sequence set forth as SEQ ID NO: 78 with a deletion, insertion, substitution or addition of one or a plurality of amino acids, and having aminoketone asymmetric reduction activity.

32. A vector according to claim 30, characterized in that the aminoketone asymmetric reductase gene is a nucleic acid consisting the nucleotide sequence set forth as SEQ ID NO: 79, or a nucleic acid that hybridizes with nucleic acid having a nucleotide sequence complementary to the nucleotide set forth as SEQ ID NO: 79 under stringent conditions, and that codes for a protein having aminoketone asymmetric reduction activity.

33. A transformant containing a vector according to claim 28 or 29.

34. A transformant containing a vector according to any one of claims 30 to 32.

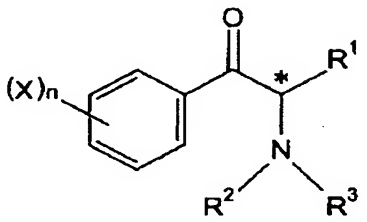
35. A method for production of an aminoketone asymmetric reductase, which comprises a culturing step in which a transformant according to claim 34 is cultured in medium that allows growth of said transformant, and

a purification step in which the aminoketone asymmetric reductase is purified from said transformant obtained in said culturing step.

36. A method for production of an optically active aminoalcohol, wherein an aminoketone asymmetric reductase obtained by the production method of claim 35 is reacted with an enantiomeric mixture

of an α-aminoketone compound represented by the following general formula (1):

[Chemical Formula 1]



... (1)

wherein X may be the same or different and represents at least one species selected from the group consisting of halogen, lower alkyl, hydroxyl optionally protected with a protecting group, nitro and sulfonyl;

n represents an integer of 0 to 3;

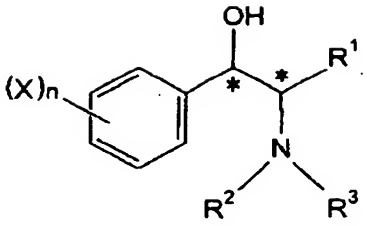
R^1 represents lower alkyl;

R^2 and R^3 may be the same or different and represent at least one species selected from the group consisting of hydrogen and lower alkyl; and

* represents asymmetric carbon,

or a salt thereof, to produce an optically active aminoalcohol compound represented by the following general formula (2):

[Chemical Formula 2]

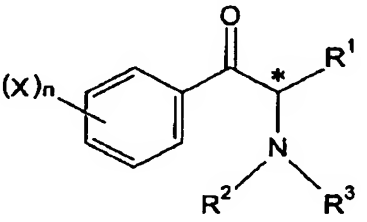


... (2)

wherein X, n, R^1, R^2, R^3 and * have the same definitions as above, and having the desired optical activity.

37. A method for production of an optically active aminoalcohol, wherein a transformant according to claim 34 is reacted with an enantiomeric mixture of an α-aminoketone compound represented by the following general formula (1):

[Chemical Formula 3]



... (1)

wherein X may be the same or different and represents at least one species selected from the group consisting of halogen, lower alkyl, hydroxyl optionally protected with a protecting group, nitro and sulfonyl;

n represents an integer of 0 to 3;

R^1 represents lower alkyl;

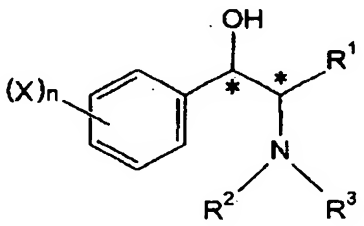
R^2 and R^3 may be the same or different and represent at least one

species selected from the group consisting of hydrogen and lower alkyl; and

* represents asymmetric carbon,

or a salt thereof, to produce an optically active aminoalcohol compound represented by the following general formula (2):

[Chemical Formula 4]

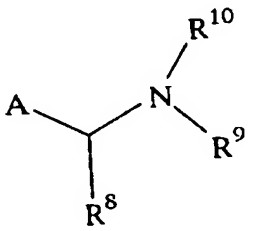


... (2)

wherein X, n, R^1, R^2, R^3 and * have the same definitions as above, and having the desired optical activity.

38. A production method for an optically active aminoalcohol according to claim 37, wherein the production method for the optically active aminoalcohol is carried out with further addition of a compound represented by the following general formula (3):

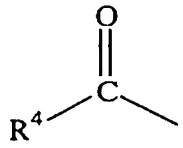
[Chemical Formula 5]



... (3)

wherein A represents the following formula (Y) or (Z):

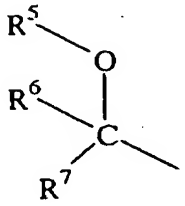
[Chemical Formula 6]



... (Y)

wherein R^4 represents hydrogen, optionally substituted C1-3 alkyl, a C5-10 hydrocarbon ring which is bonded to R^8 or a 5- to 8-membered heterocyclic skeleton containing 1-3 heteroatoms which is bonded to R^8,

[Chemical Formula 7]



... (Z)

wherein R^5 represents hydrogen, C1-3 alkyl or a 5- to 8-membered heterocyclic skeleton containing 1-3 heteroatoms which is bonded to R^6 or R^9;

R^6 represents hydrogen, optionally substituted C1-3 alkyl, a C5-10 hydrocarbon ring which is bonded to R^8 or a 5- to 8-membered heterocyclic skeleton containing 1-3 heteroatoms which is bonded to R^5 or R^9;

R^7 represents hydrogen or optionally substituted C1-6 alkyl;

R^8 represents hydrogen, carboxyl, optionally substituted C1-6 alkyl, a

5- to 8-membered heterocyclic skeleton containing 1-3 heteroatoms which is bonded to R^4 or a C5-10 hydrocarbon ring which is bonded to R^6;

R^9 represents hydrogen, optionally substituted C1-6 alkyl, optionally substituted C1-6 alkyloxycarbonyl, optionally substituted acyl or a 5- to 8-membered heterocyclic skeleton containing 1-3 heteroatoms which is bonded to R^5 or R^6; and

R^{10} represents hydrogen or optionally substituted C1-6 alkyl,

or a pharmaceutically acceptable salt or solvate thereof, for production of an optically active aminoalcohol.